PHYSICOCHEMICAL CHANGES IN SAUSAGE-TYPE MEAT EMULSIONS WITH FIBER ADDITION

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INTRODUCTION

There is a mundial trend on consuming healthier and more fibber-containing products. Fibber inclusion has beneficial effects for human health and improves technological properties useful for industry.

OBJECTIVES

The aim of the study was to observe physicochemical changes of sausage-type meat emulsions modifying variables: increasing different type of fiber content, decreasing water content and maintaining meat and fat content.

1. 20 kg turkey meat batch and 3 kg cow fat batch.. Fat won't be cuted,
2. Meat batter
   Example: 25s >1800 rev
3. Vacuum bags of 0,1kg and 0,5 kg.
   T = -18±1°C
4. Mix and chop using minipimer
   T= 2±2°C
5. Stuff without air bubbles ccoked at T= 70±1°C
6. Exude in metal grid
   T= ±2 °C
7. Weight measure
8. Parameter determination and data analysis

Equal	**% Fat/Lean**	**10 / 10 / 10 / 10**
	▪ NaCl	20 / 20 / 20 / 20
	▪ Tripoli	5 / 5 / 5 / 5
	▪ Ascorbat	0,5 / 0,5 / 0,5 / 0,5
P.1	**% Fiber**	**10 / 5 / 1 / 0**
	▪ Carn	650 / 650 / 650 / 650
	▪ Greix	65 / 65 / 65 / 65
	▪ H2O	159,5 / 209,5 / 249,5 / 259,5
	▪ Fibra	100 / 50 / 10 / 0
P.2	**% Fiber**	**5 / 3 / 1 / 0**
	▪ Carn	500 / 500 / 500 / 50
	▪ Greix	50 / 50 / 50 / 50
	▪ H2O	374,5 / 394,5 / 414,5 / 424,5
	▪ Fibra	50 / 30 / 10 / 0
P.3	▪ Carn	450 / 450 / 450 / 450
	▪ Greix	50 / 50 / 50 / 50
	▪ H2O	424,5 / 444,5 / 464,5 / 474,5
	▪ Fibra	50 / 30 / 10 / 0
P.4	▪ Carn	350 / 350 / 350 / 350
	▪ Greix	35 / 35 / 35 / 35
	▪ H2O	539,5 / 559,5 / 579,5 / 589,5
	▪ Fibra	50 / 30 / 10 / 0

- COOKING LOSS: WEIGHT DIFFERENCE BEFORE AND AFTER COOKING.
- TEXTURE: TEXTUREMETER WITH SENSOR 100/P, CRUSHING 90%, DOWN SPEED: 2MM/S AND 2'5 OR 3CM WIDTH.
- PH: PHMETER
- AW: HYGROMETER AQUALAB AT 25°C
- COLOR: COLORIMETER. L* A* B* COORDINATES

RESULTS

Test tube heigh (mm)	Fiber (%)	Fracture force (N)	Fracture deformation	Fracture work (Joule)	Total work (Joule)
25	0	$40,7^{b}$ ± 5,8	61,0 ± 5,6	$0,229^{b}$ ± 0,037	$0,753^{b}$ ± 0,055
	1	$64,0^{a}$ ± 1,2	61,8 ± 0,1	$0,326^{a}$ ± 0,019	$1,005^{a}$ ± 0,011
30	0	$35,1^{b}$ ± 6,4	55,6 ± 4,2	$0,218^{b}$ ± 0,057	$0,858^{b}$ ± 0,049
	1	$66,8^{a}$ ± 1,6	59,746 ± 0,1	$0,413^{a}$ ± 0,013	$1,228^{a}$ ± 0,001

	Lupinus albus				*Amaranthus spp*	
Meat %	65				35	
Fiber %	0	1	5	10	0	1
Cooking loss	1,227 ± 0,171	1,223 ± 0,061	1,118 ± 0,122	0,789 ± 0,433	6,946 ± 0,486	4,442 ± 0,277
aW	0,982 ± 0,001	0,976 ± 0,002	0,974 ± 0,002	0,971 ± 0,002	0,984 ± 0,001	0,978 ± 0,001
pH	6,41 ± 0,03	6,36 ± 0,01	6,21 ± 0,0	6,16 ± 0,03	6,36 ± 0,02	6,38 ± 0,01

DISCUSSION

- Rheology changes are observed between pork and cow fat.
- The emulsion formulation has been modified until obtaining a control formula that loses enough water to see significant changes in cooking losses when fiber is added.
- The result of the investigation allows obtaining a hybrid product (a product with less meat protein and an increase in plant intake).
- Hybrid products are cheaper for the industry so they can reach more people such as the malnourished

	Lupinus albus				*Amaranthus spp*	
Fiber %	0	1	5	10	0	1
L*	70,29 ± 1,84	75,43 ± 1,01	74,44 ± 0,93	72,28 ± 0,62	78,52 ± 0,62	78,52 ± 0,54
a*	2,68 ± 0,72	2,08 ± 0,36	3,23 ± 0,27	4,66 ± 0,26	0,87 ± 0,26	-0,06 ± 0,32
b*	8,81 ± 1,48	10,48 ± 0,75	12,94 ± 0,61	13,76 ± 0,70	7,25 ± 0,32	8,16 ± 0,29
AE	0	5,44	5,88	5,69	0	1,30

CONCLUSION

Fiber addition results in coking loss and aW decrease. pH varies according to the fiber composition. There are color differences when fiber is included and the emulsion texture has more consistence.